

VOCATIONAL INTEREST FACTORS AND
THEIR CORRELATION WITH EDUCATIONAL
CLASSIFICATION

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VOCATIONAL INTEREST FACTORS AND THEIR
CORRELATION WITH EDUCATIONAL CLASSIFICATION

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Presented to
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In Partial Fulfillment
of the requirements for the Degree
Master of Arts
in Psychology

by
Kathlyn Sue Sim Tyau Moore

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To the Graduate Council:

I am submitting herewith a Research Paper written by Kathlyn Sue Sim Tyau Moore entitled "Vocational Interest Factors and Their Correlation with Educational Classification." I recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Arts, with a major in Psychology.

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Major Professor

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INTRODUCTION AND REVIEW OF THE LITERATURE

Research in vocational interests is an area that has involved psychologists for many years. The exploration of what interests are, how they can be measured, how they develop, and how they relate to other behavior has produced a voluminous amount of literature. Vocational research currently emphasizes the biases (sex, age, race, physical characteristics) that affect careers, occupational classification, the origins of interests, the measurement of interests, vocational aspirations, career decision making, and career histories (Holland, Magoon, and Spokane, 1981).

The search for the factor structure of vocational interests has a history going back to the work of Thurstone (1931). The quest to find these dimensions has resulted in disagreement about the number of factors which exist as well as in the development of models in an effort to interpret these interests factors (Roe, 1956; Holland, 1970). Efforts have been directed toward applying the identified factors to assist in career intervention and to predict job affinity correctly. The purpose of the present research was to join in the investigation for a definitive factor structure of interests and to explore the relationship of such a structure with the major field of study.

The relevant literature on the dimensions of vocational

interests is based on inventories of interests. There are a variety of ways to measure interests. The most common way is an inventory listing activities to which individuals express their preference. By differentially weighting items to maximize score differences among occupational groups, patterns of interests which relate to various occupational categories can be established for individuals. Examples of such inventories which have been standardized are the Kuder Preference Record and the Strong Campbell Interest Inventory. A variation of these more familiar inventories is Holland's (1978) Vocational Preference Inventory. It is based on preferences for occupations which reflect an individual's personality orientation as well as his vocational compatibility. Exploratory factor analysis of large groups of individuals' responses to inventories like those referred to above have provided data on the dimensions of interests.

The debate in early factor analytic work concerned the appropriateness of obtained factor structures. Numerous studies extracted factors from disparate groups' responses on various interest inventories. Different groups and diverse inventories produced many forms of interest structures. The validity of each structure is to a large extent dependent on the nature of the subjects and the stimulus items. The finding of differences in dimensions was inevitable. Factor analytic studies of vocational

interests are too numerous to be cited comprehensively so only relevant and unique findings will be presented.

Thurstone distilled four factors from the Strong Vocational Interest Blank: Science, People, Language, and Business. Later factor analytic studies of general standardized vocational inventories have confirmed these factors and even added more factors such as a Things vs. People factor, a Business Systems factor, and a Business Contract factor (Strong, 1943). Guilford, Christensen, Bond and Sutton (1954) derived 24 and 23 factors for Air Force enlisted men and officers respectively using a 1,000 item inventory. Both groups had eight common vocationally relevant factors: Scientific, Social Welfare, Mechanical, Outdoor Work, Clerical, Business, Aesthetic Expression, and Aesthetic Appreciation. Super and Crites (1962) summarized factor analytic research and concluded that there are six factors commonly found in most factor analytic studies of vocational interests: Scientific, Social Welfare, Literary or General Culture, Material or Concrete, Record-keeping or Systematic, and Personal Contact. Additionally, many but not all of the studies yielded some other kind of factor alternately termed Artistic, Musical, Aesthetic or Appreciative. The factor analytic studies of vocational interest inventories have extracted factors which reveal what basic interest categories are with respect to context. However, the actual components of these interests were not

thoroughly addressed for several more years.

Rounds and Dawis' (1979) truly complete factor analysis of the Strong Vocational Interest Blank resulted in 11-13 factors with a common core of factors (eight or nine) depending on sex and occupation. The male sample had eight factors: Aesthetics, Religion, Meeting and Directing People, Business Contact, Mechanical Activity, Athletics, Nature, and Military Activity. They were roughly equivalent to the female sample's nine common factors of Aesthetics, Religion, Meeting and Directing People, Clerical Activity, Medical Science, Fashionable Appearance, Domestic Arts, Mathematics and Teaching. Other unique factors for specific samples were Security vs. Adventure, Nonconformity, Scientific Activity, and Social-Public Service. Most of these factors could be related to Super and Crites' six primary vocational interest factors. The different factors may be due to the specific inventory that was utilized, the extremely large population sample total of 9,974 people, and the fact that this was the very first factor analysis in which single items rather than groups of items were used as computational variables due to more sophisticated computer techniques and advances that had been developed.

John L. Holland, who has been investigating the dimensions of vocational interests, has developed a theory of vocational development and devised two instruments to measure these interests: the Vocational Preference Inventory

and the Self-Directed Search. Holland's theory has four assumptions relating to the six personality types, the six corresponding environments which he believes to exist in our culture, the tendency for people to seek the environment which matches their personality type, and the behavior which he believes is determined by personality and environmental characteristics. His theory assumes that personality and vocational preferences are integrally related and that vocational preference is a reflection of a person's motivation, knowledge, personality, and ability. The first instrument Holland developed, the Vocational Preference Inventory, served as the validation of his ideas and theory that vocational preferences are signs of personality traits. (Holland, 1966b). The focus of the remainder of this paper will be on the Vocational Preference Inventory (Holland, 1978) and its related research.

The Vocational Preference Inventory (VPI) was first formulated in 1958 and the latest revision (number seven) was done in 1977. It is an inventory composed entirely of occupational titles to which an individual responds by indicating a like, a dislike, or no preference. There are eleven scales corresponding to Holland's six personality types plus five other scales: Realistic, Intellectual, Social, Conventional, Enterprising, Artistic, Self-Control, Masculinity, Status, Infrequency, and Acquiescence. The last five scales have also been called personality traits

by Wakefield, Alston, Yom, and Doughtie (1975). They also could be considered response style scales. From his theory and the results of large scale testing with the VPI, Holland has also produced a hexagonal model depicting the relationships among the six personality types. Each of the types is one of the points in the hexagon and the distance between any of the types represents the amount of dissimilarity between these personality types. The circular ordering of the types rotates from Conventional to Realistic to Intellectual to Artistic to Social to Enterprising and back to Conventional. This is often referred to as the RIASEC model (Holland, 1973). Additionally, Holland (1966a) has classified common occupations according to the six personality/occupational scales. An occupation is coded by the most salient three scales for that particular occupation. Thus, a nurse is coded "SAI" or Social-Artistic-Intellectual. Holland is able to relate an individual's score on the VPI scales to many common occupational areas (Holland, 1966a). Holland has essentially created a common denominator by which he can relate an individual's vocational needs to the sources of fulfillment.

More recent studies have attempted to map the categories of interests into two, three, or even four dimensions. Wakefield and Doughtie (1973) tested the geometric correspondence between the hexagon model and the

VPI. They found the placement of the six personality types in common factor space generally corresponds to Holland's hexagon model. Rounds, Davison, and Dawis (1979) also examined the fit of the VPI scales using a multidimensional scaling approach and found that male responses to the Holland scales fit the RIASEC hexagon model less well than female responses and that a symmetrical equilateral hexagon (a two-dimensional configuration) may not be the best fit for the scales. On the other hand, Edwards and Whitney (1972) found strong empirical support for the hexagonal arrangement of personality types by using the Self-Directed Search which Holland developed from the VPI. Similarly, Lunneborg and Lunneborg (1975) analyzed the Vocational Preference Inventory in addition to their own Vocational Interest Inventory (VII) and suggested that a circular or hexagonal ordering of occupations may be too simplistic and that a better understanding of the structure of vocational interests could be grasped by four orthogonal dimensions. Scores were factors from the VPI projected into the best fitting plane as well as the best fitting n-dimensional space. Factoring of the VPI and the VII together produced five dimensions and accounted for 76% of the variance: Social vs. Technical, Realistic, Organization vs. Outdoor, Science vs. Business, and Artistic. Varimax rotation of the three significant components of the VPI scores alone (obtained from 235 students) was projected best in a three-

dimensional space.

Factor analytic studies of the VPI imply that there are between three and six common factors underpinning Holland's RIASEC model and the VPI. A definitive set of functional dimensions has not been produced despite great effort. Wakefield and Doughtie (1973) intercorrelated and factor analyzed the eleven scales of the VPI (6th Revision) taken by 373 undergraduates and found six common factors: Conventional-Economic, Feminine-Social, Social Desirability, Material World Orientation, Status, and Artistic. These factors accounted for 71% of the total variance. The correlation matrix of the VPI scales was obtained by Pearson product-moment correlations between each pair of VPI scales and factored by the principal factors method. All the factors with positive eigenvalues were varimax rotated. Loadings on these factors accounted for the names given the six common factors. No analysis of the data was done separately by sex. The investigators cited Holland's data in the 1970 manual of the VPI which found no significant differences between the intercorrelations of the VPI scales for males and females who were National Merit Finalists.

DiScipio (1974) also used the sixth revision of the VPI and did a principal component analysis for men and women separately on 135 items of the VPI. Twenty-five items were eliminated because of their intercorrelations of .60 or greater. He used a sample population of 300 students

(100 men, 200 women) at a large urban university. DiScipio found 36 gradually ordered factors with eigenvalues or latent roots greater than or equal to one. Since such a large number of factors would not be very meaningful, he chose the first ten factors to be orthogonally rotated by the Varimax method and obliquely rotated by the Promax method and eventually settled on eight factors which accounted for 43% of the total variance for women and 45% of the total variance for men. DiScipio defends the validity of the factor analysis results in the men's samples by citing the similarity of the Kaiser Factor comparison coefficient between the male and female derived factors. He found seven common factors for both men and women (Clerical, Scientific, Manual, Teaching and Counseling, Physical Risk, Artistic, and Law and Politics) plus a male-only factor of Public Service and a female-only factor of Teaching. Explanation of the differences between his eight factors and Holland's scales was based upon the characteristics of the sample and the sociopolitical time context.

Finally, Lunneborg and Lunneborg (1975) identified three factors by principal components analysis which have eigenvalues in excess of unity and which accounted for 77.5% of the variance in a combined sex sample of 235 undergraduates (136 females, 99 males). The factors were identified as Enterprising-Conventional, Realistic-Investigative, and Artistic-Social. Obviously, factor

analysis of the VPI is relative and the results depend on the number and type of subjects.

The ability of adults to differentiate and generalize occupations and jobs has not been studied in depth. Holland (1966b) defends the use of occupational titles conjuring up stereotypes in the VPI by stating that the stereotypes are useful in terms of their psychological and sociological meaning. Differentiation of job content areas probably occurs with most college students and is reflected in their choice of major field of study.

DiScipio (1974) divided his student sample into three criterion groups for men and added Education to those groups for women. The Art group included performing and literary arts majors. The Science group had theoretical and applied science majors. The Social Science group was composed of Psychology, Economics, and Political Science majors. DiScipio found three out of his eight derived factors for men (Scientific, Teaching and Counseling, Artistic) significantly differentiated the criterion groups or grouped majors. Five of the eight derived factors for women (Teaching, Scientific, Manual, Teaching and Counseling, Artistic) similarly corresponded to the criterion groups.

Earlier, Holland (1966a) used the VPI to calculate a classification for vocations and assigned the first three VPI high point codes he obtained to a variety of career preferences. He also established a classification for

major fields which he states is very similar to his classification for vocations. Tables given in the Manual for the VPI (1978) support this fact.

Osipow and Ashby (1968) reversed Holland's approach to vocational classification and matched educational preferences which were given a RIASEC factor identification to VPI profile codes. They found that educational preference and the primary VPI scale score were consistent with Holland's theory.

Neither of the last two cited studies went further to predict majors from VPI profiles. DiScipio, on the other hand, found his factors (which were used instead of the RIASEC factors) differentiated majors combined in criterion groups but he also did not develop these results into a prediction pattern using a combination of his factors or a profile score.

In summary, the present study investigated the number of factors in vocational interests that can be obtained from an administration of the VPI and assessed the correlation of interest factors with major fields of study. It was hypothesized that common factors would emerge to differentiate educational preference and that a profile of interests would be related to declared major.

METHOD

Subjects

The subjects in this study were 18 U.S. Army reservists from the 306th Medical Company (Clearing) at Nashville, Tennessee and 282 students enrolled at Austin Peay State University. The sample was composed of 131 males and 169 females. The age range of the same was 19 to 53 years old with a mean age of 26.93 years and a standard deviation of 7.38 years. There were 24 different majors represented. Education was the largest group of majors (54 subjects), followed by Business (48), Nursing (45), Psychology (34), Social Welfare (18), Computer Science (16), and Industrial Technology (15). All other majors were represented by ten subjects or less. There were 235 undergraduate and 65 graduate students. Over one-third of the subjects had work experience in their major field.

Subjects were secured by soliciting under no duress volunteers in the reserve unit and by obtaining permission from the university professors to test their upper division classes. All subjects were given a preliminary introduction to the purpose of this study and their voluntary consent and participation were obtained (see Appendix C). Information about the subject's sex, age, major field, undergraduate or graduate status, and work experience in their major field was recorded on answer sheets for later statistical

analysis.

Description of the Instrument

The instrument used for data collection was the seventh revision of the Vocational Preference Inventory (Holland, 1977). It consists of 160 occupational titles to which positive interest is indicated by marking "yes," or dislike by marking "no," and no mark for undecided on a separate answer sheet. There are eleven scales in the inventory. The first six scales correspond to Holland's six personality types (RIASEC) and the additional five scales are also personality descriptors. All items on the VPI were retained for analysis despite a few high ($>.60$) interitem correlations.

Administration and Scoring

The VPI was administered outdoors at Redstone Army Arsenal, Alabama during breaks in field training of the reserve unit and in classrooms at Austin Peay State University. Individual as well as group administration was conducted within a 20 to 25 minute time span. The largest group of students tested was 42. A brief introduction and explanation preceded the VPI administration (see Appendix C). The inventories were then distributed and the subjects asked to record statistical information, read the directions, and answer the questions. The inventories were

scored by individual variables being entered manually into selected computer programs.

Statistics

Principal components factor analysis followed by Varimax rotation was computed on one-half of the VPI response variables for 300 students at one time. The division of the variables into groups of 80 was necessitated by the limits of the computer programs available for use to this investigator. The VPI variables were divided by odd-even and split-half procedures. The eighty odd numbered VPI variables were factor analyzed together. The eighty even numbered VPI variables were also analyzed together using the same statistics. The first eighty variables (numbers 1-80) were similarly analyzed as were the last eighty variables (numbers 81-160). Discriminant analysis of the Holland scale scores was done by using SPSS Version Eight (Nie, Hull, Jenkins, Steinbrinner, & Bent, 1975). All statistical manipulation was done on the Austin Peay State University VAX 11/780 computer.

RESULTS

There was a range from 21-31 interest factors in this sample with eigenvalues greater than or equal to unity by factor analysis. The different number of factors reported here depended on the specific VPI variables used in the analyses. If the criterion of at least 75% or more of the total variance to be accounted for by the factors prior to rotation is used, there were between 29 and 32 factors isolated. There were 7-10 factors with eigenvalues greater than 2; however, the multiple R square statistic was consistently greater than the communality for the number of variables. This statistic makes these 7-10 factors as primary interest factors inaccurate. Factor analysis of the VPI results using Holland's scale scores revealed three factors with eigenvalues greater than 1. The fourth factor had an eigenvalue of 0.9950 and could really be considered with the others. The four factors together accounted for only 74.3% of the variance. There were 2 moderately high intercorrelations of scales 1 and 7 (-0.599) and of scales 6 and 11 (0.588).

To explore the interpretation of VPI scale scores in relation to the sample population grouped by majors, a discriminate analysis was performed. The 24 different majors represented were consolidated by their content similarity into nine groups. Group 1 consisted of majors

in Art, Music, Speech & Theatre, and English. In Group 2 were History and Political Science majors. Group 3 combined majors in Economics, Public Management, Business, and Management Technology. Group 4 consisted of Biology, Chemistry, Geology, and Agriculture majors. Computer Science majors composed Group 5. Sociology, Social Welfare, and Psychology majors were in Group 6. Group 7 consisted of majors in General Studies, Health and Physical Education, and Industrial Technology. Education majors were in Group 8. And in Group 9 were Nursing majors. Each of these groups are independent of each other at the 0.01 level of significance with (10, 282) degrees of freedom. Four functions discriminated among these 9 groups at the .01 level of significance. Holland's Social and Artistic scales loaded on function 1. Function 2 was defined by the Realistic scale. Function 3 was a complex function defined by the Conventional, Enterprising, Status, and Masculinity scales. Function 4 was principally defined by the Intellectual scale. A summary of the loadings on the functions is presented in Table 2. Finally, a hit rate of 51.0% was obtained when predicting from the VPI scale scores to the common major group membership (see Table 1). The average profiles of each common major group are presented in Appendix B (see Figures 1-9).

CHAPTER IV

DISCUSSION

The results presented in the previous chapter support the hypothesis that common factors will emerge from VPI responses and that these factors can differentiate educational preference. The hypothesis that a profile of interests can accurately discriminate a declared major was also supported. However, clear and useful common factors could not be obtained through factor analysis of the individual items on the VPI. Four functions or factors were obtained by discriminate analysis of the subjects' scale scores devised by Holland.

Finding 21-31 interest factors by factor analysis of individual VPI variables could be attributed to the sample's characteristics. DiScipio (1974) cited his sample's characteristics and the sociopolitical time frame of his VPI administration to account for his finding 36 factors using 135 of the 160 items in the sixth revision of the VPI. The subjects in this study appeared to be very homogenous, older than the usual college sample, more experienced, and found in university programs which produce professionals expected to display some occupational versatility. They had declared majors and were reasonably committed to the completion of their major. While the predictive rate for majors was 51% (see Table 1), it may be

biased by subjects who declared a major which is incompatible with their true interests but who still remain in the field due to extrinsic pressures. Further research is necessary for a long term study of the stability of declared majors.

Other investigators (Lunneborg and Lunneborg, 1975; Wakefield and Doughtie, 1973) factor analyzed VPI scales rather than individual items and found between three and six common factors in the VPI. The four factors/functions found in this study using the VPI scale scores corresponded fairly closely to Holland's RIASEC factors (see Table 2). It appears that Holland's scales cannot be empirically derived from the individual items by traditional factor analytic procedures.

Descriptions of each major group were generated by discriminate analysis (see Table 3). The characteristics of a specific group generally were in agreement with stereotyped expectations, e.g., Group 6 consisting of Sociology, Social Welfare, and Psychology majors was high in Function 1 (Social-Acquiescent-Artistic).

In conclusion, this study attempted to find common factors of vocational interests. The evidence leads to the conclusion that four factors or personality types may be the most useful number of components in the Vocational Preference Inventory.

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APPENDIX A: TABLES

Table 1 - Prediction of Belonging to a
Common Group using VPI Scale Scores

VEY MAJOR DISCRIMINATION

CLASSIFICATION RESULTS

ACTUAL GROUP		NO. OF CASES	PREDICTED GROUP MEMBERSHIP								
			1	2	3	4	5	6	7	8	9
GROUP 1	1	12	0	0	2	0	0	2	1	7	0
			0.0%	0.0%	16.7%	0.0%	0.0%	16.7%	8.3%	58.3%	0.0%
GROUP 2	2	15	0	2	6	0	0	5	2	0	0
			0.0%	13.3%	40.0%	0.0%	0.0%	33.3%	13.3%	0.0%	0.0%
GROUP 3	3	61	0	1	42	2	2	2	5	7	0
			0.0%	1.6%	68.7%	3.3%	3.3%	3.3%	8.2%	11.5%	0.0%
GROUP 4	4	17	0	0	1	7	0	4	1	0	4
			0.0%	0.0%	5.9%	41.2%	0.0%	23.5%	5.9%	0.0%	23.5%
GROUP 5	5	16	0	0	3	1	4	0	5	0	3
			0.0%	0.0%	18.8%	6.3%	25.0%	0.0%	31.3%	0.0%	18.8%
GROUP 6	6	53	0	2	2	2	0	36	2	5	4
			0.0%	3.8%	3.8%	3.8%	0.0%	67.9%	3.8%	9.4%	7.5%
GROUP 7	7	26	0	1	3	1	1	0	17	3	0
			0.0%	3.8%	11.5%	3.8%	3.8%	0.0%	65.4%	11.5%	0.0%
GROUP 8	8	55	0	0	11	1	0	9	1	30	3
			0.0%	0.0%	20.0%	1.8%	0.0%	16.4%	1.8%	54.5%	5.5%
GROUP 9	9	45	0	0	4	1	1	5	2	13	15
			0.0%	0.0%	8.9%	2.2%	2.2%	20.0%	4.4%	28.9%	33.3%

PERCENT OF "GROUPED" CASES CORRECTLY CLASSIFIED: 51.00%

CLASSIFICATION PROCESSING SUMMARY

300 CASES WERE PROCESSED.

300 CASES WERE USED FOR PRINTED OUTPUT.

Table 2 - Loadings on Four
Significant Functions

LOADINGS ON FOUR SIGNIFICANT FUNCTIONS

	<u>HOLLAND SCALES</u>	<u>MAGNITUDE</u>
FUNCTION 1	Social	1.20839
	Acquiescence	-1.12160
	Artistic	-0.50475
	Infrequency	0.44514
FUNCTION 2	Realistic	-1.17313
FUNCTION 3	Conventional	0.63312
	Status	0.55931
	Enterprising	0.42426
	Masculinity	0.41947
FUNCTION 4	Intellectual	1.04142

Table 3 - Personality
Characteristics of the
Common Major Groups

PERSONALITY CHARACTERISTICS OF THE COMMON MAJOR GROUPS

GROUP	FUNC 1	FUNC 2	FUNC 3	FUNC 4
1	0.44802	-0.14986	-0.66314	-0.94606
2	0.73222	-0.04435	1.25380	-0.16145
3	-0.86389	0.17830	1.05319	-0.36142
4	-0.28817	0.08756	0.04201	1.44897
5	-0.77538	-0.97784	0.25081	0.94710
6	1.27159	0.25785	-0.24405	0.14991
7	-0.77008	-2.09793	0.17491	0.16905
8	0.11311	0.61564	-0.60163	-0.52274
9	0.00110	0.28364	-0.85210	0.27656

FUNC 1 Social-Acquiescent-Artistic

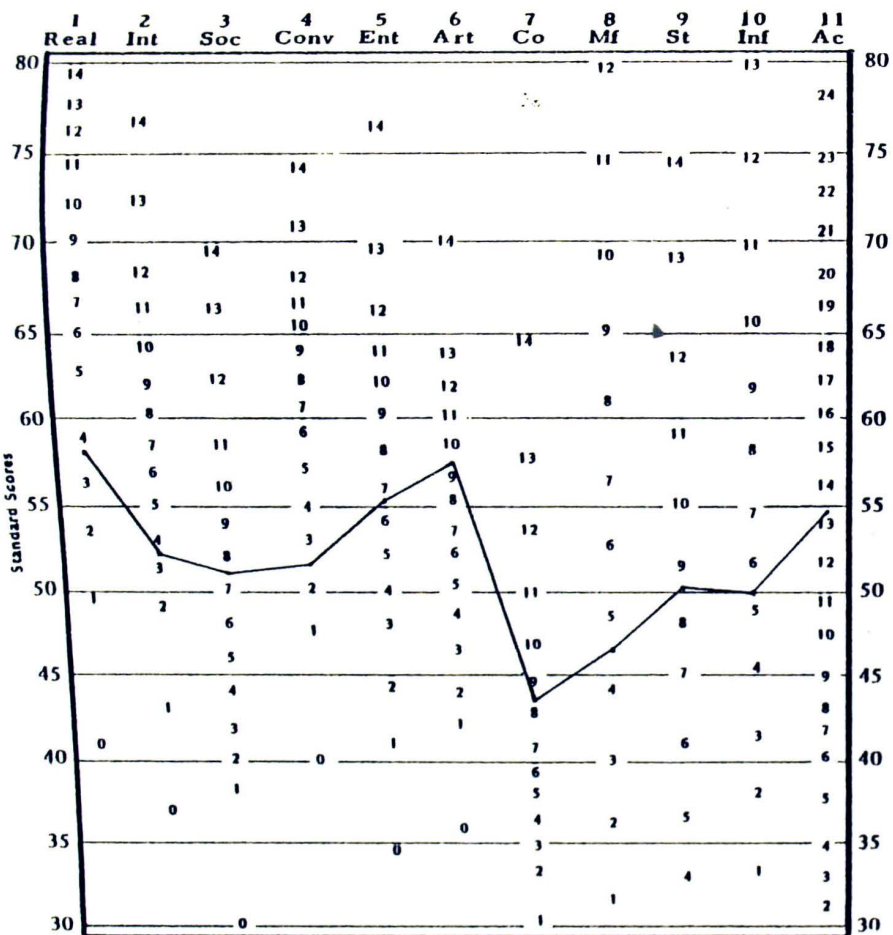
FUNC 2 Realistic

FUNC 3 Conventional-Status-Enterprising-Masculine

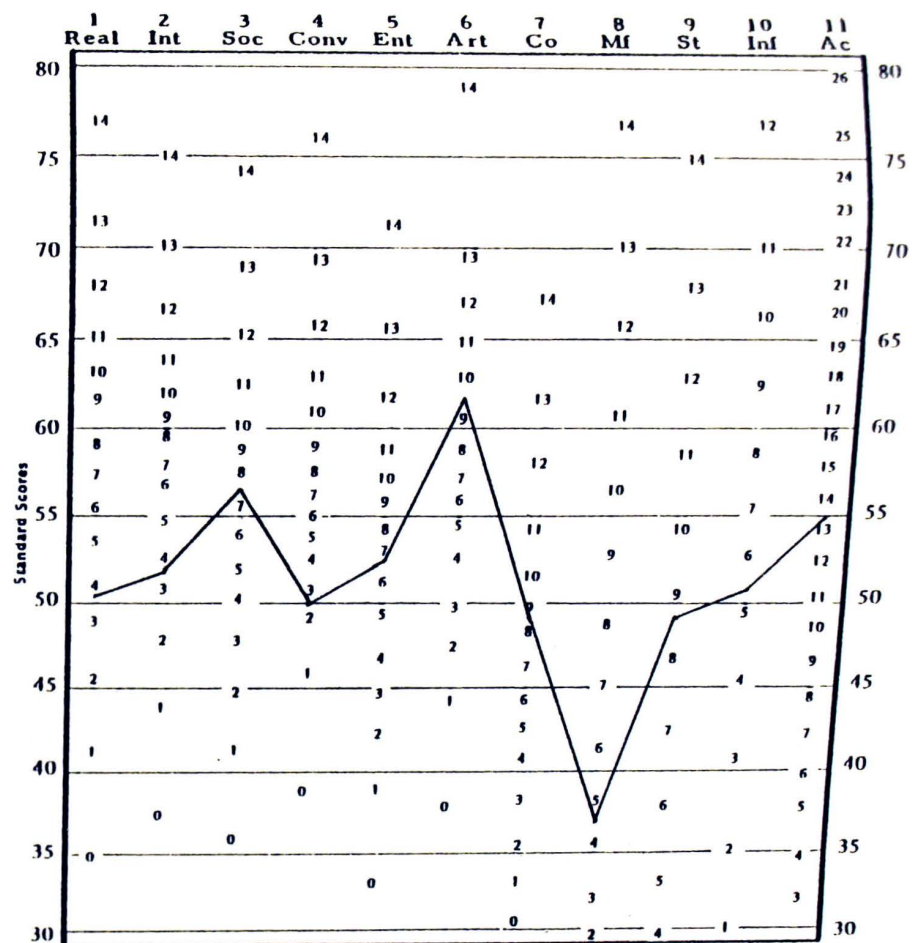
FUNC 4 Intellectual

APPENDIX B: FIGURES

Figure 1 - Profile of Mean
VPI Scores of Group 1
consisting of Art, Music, Speech,
and English majors

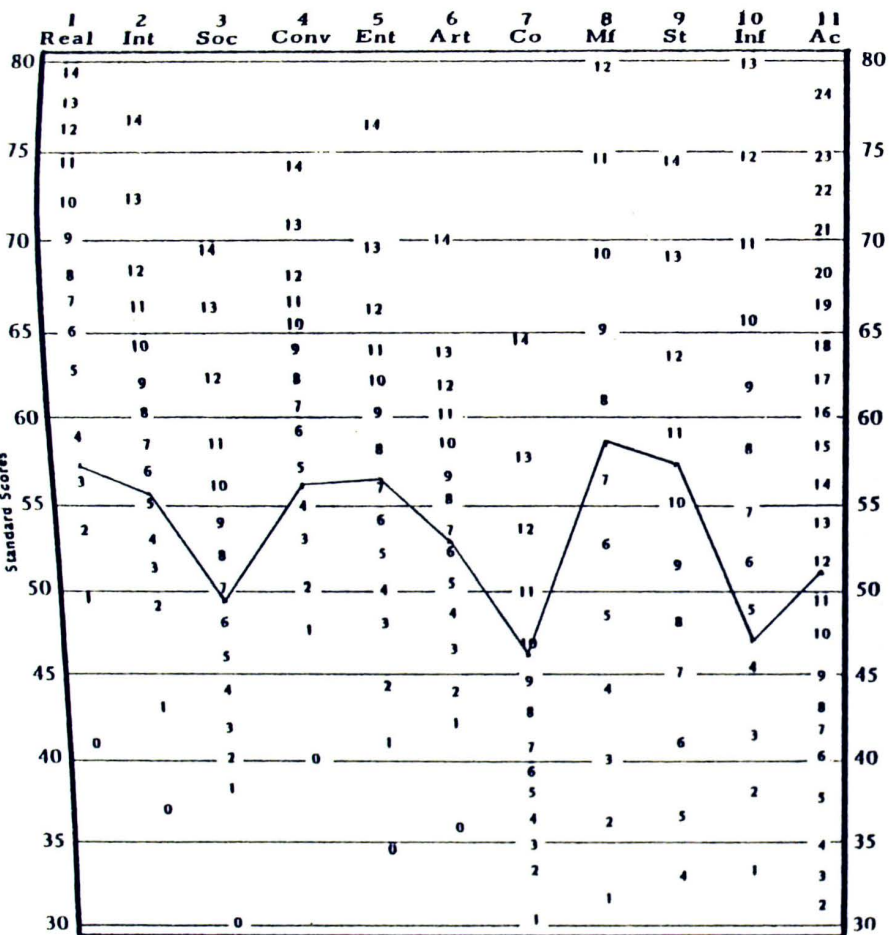


FEMALES

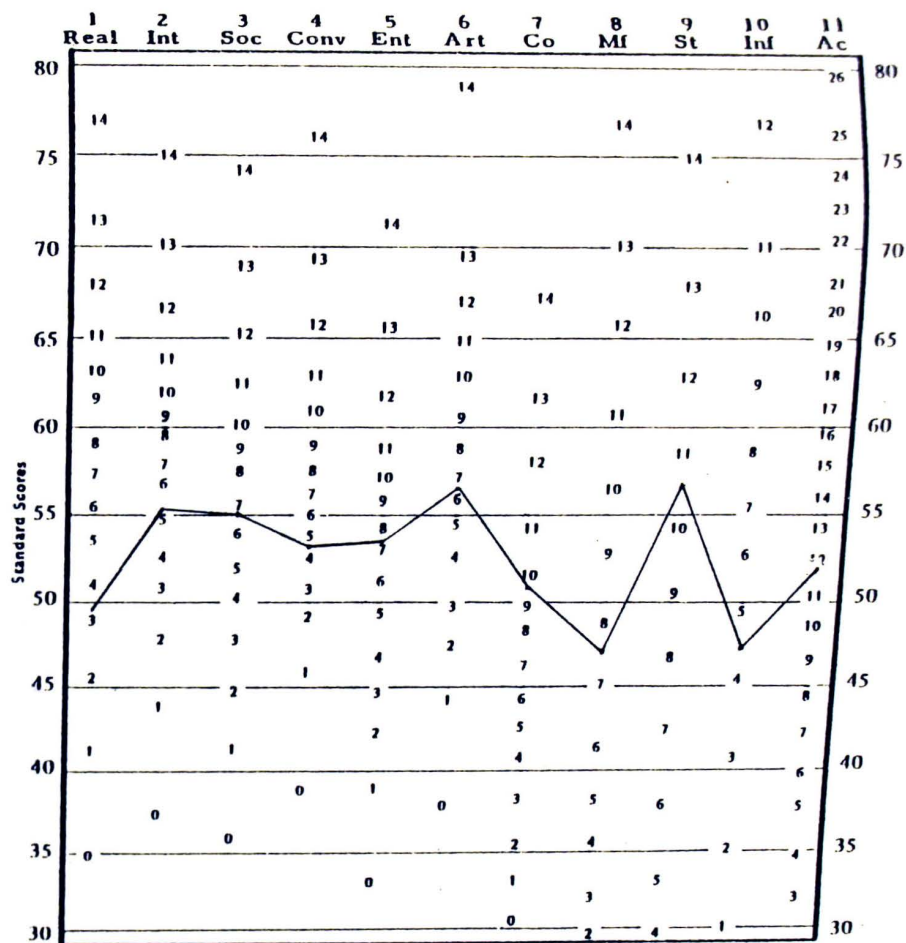


MALES

Figure 2 - Profile of Mean
VPI Scores of Group 2
consisting of History and
Political Science majors

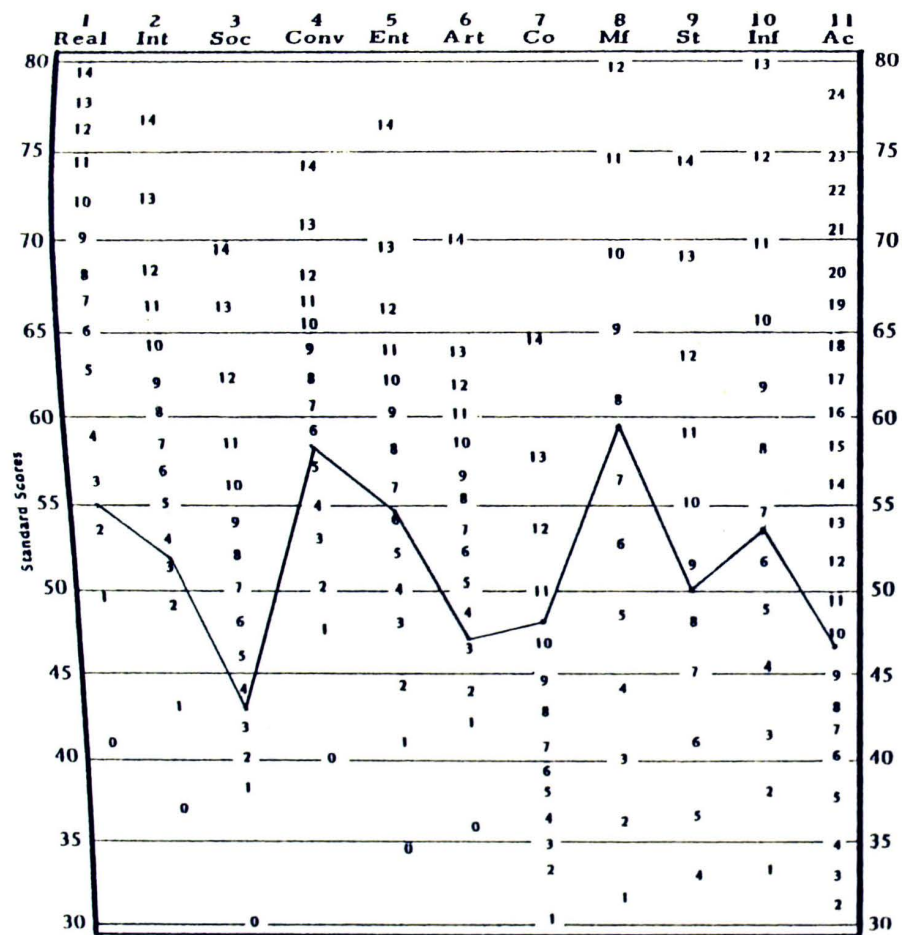


FEMALES

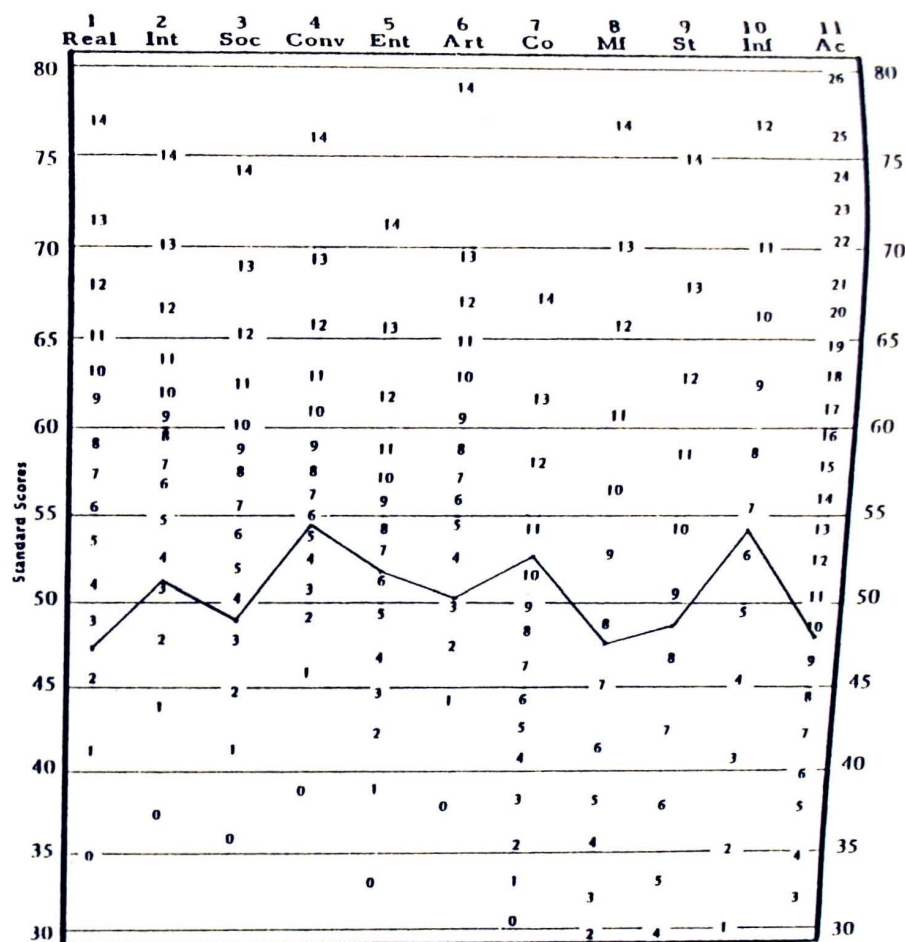


MALES

Figure 3 - Profile of Mean
VPI Scores of Group 3
consisting of Business,
Economics, and Management
majors

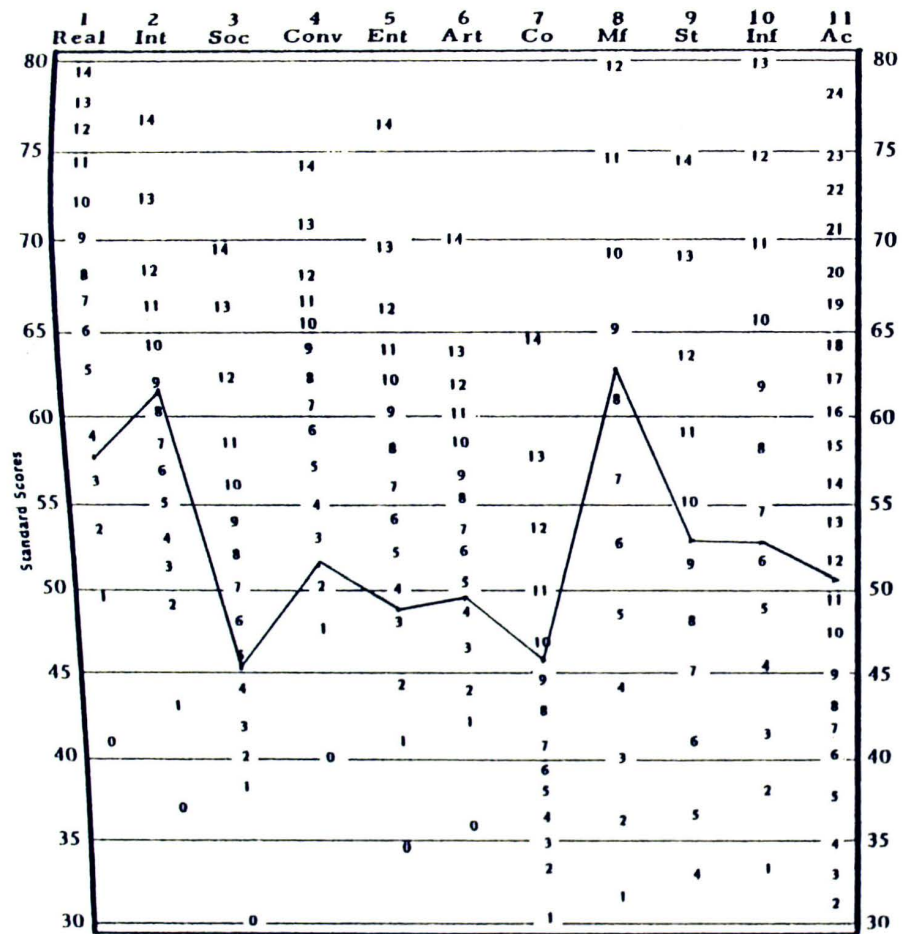


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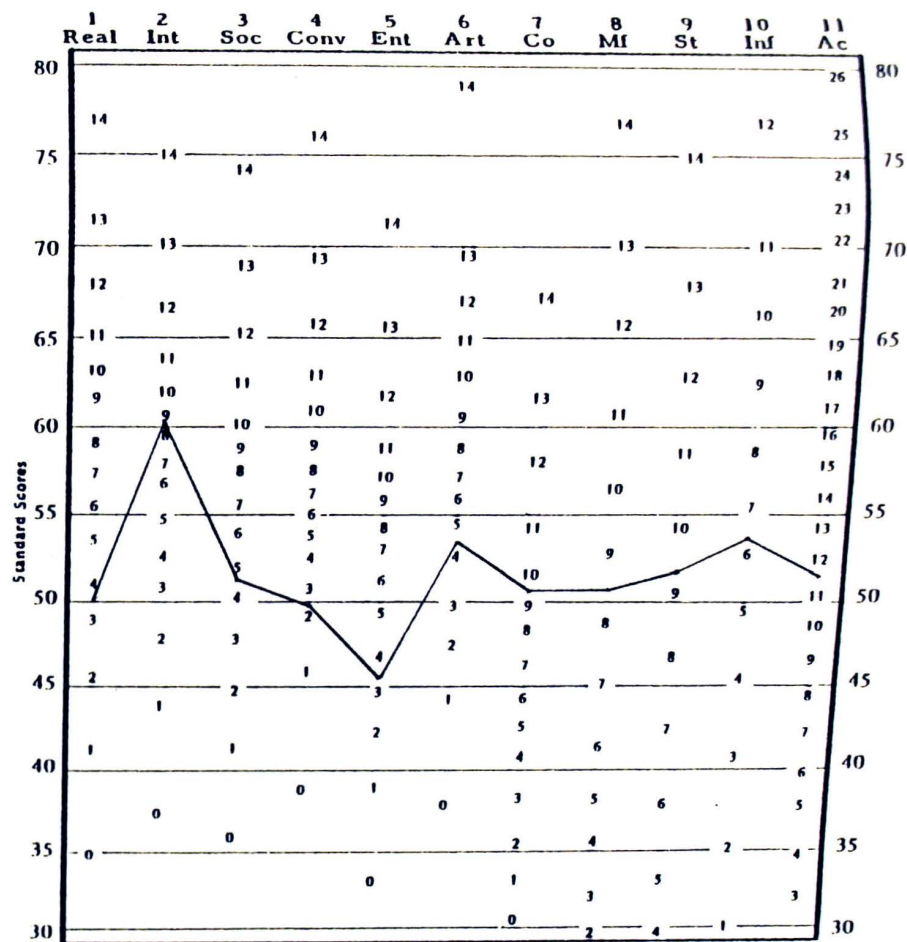


MALES

Figure 4 - Profile of Mean
VPI Scores of Group 4
consisting of Biology, Chemistry
and Geology majors

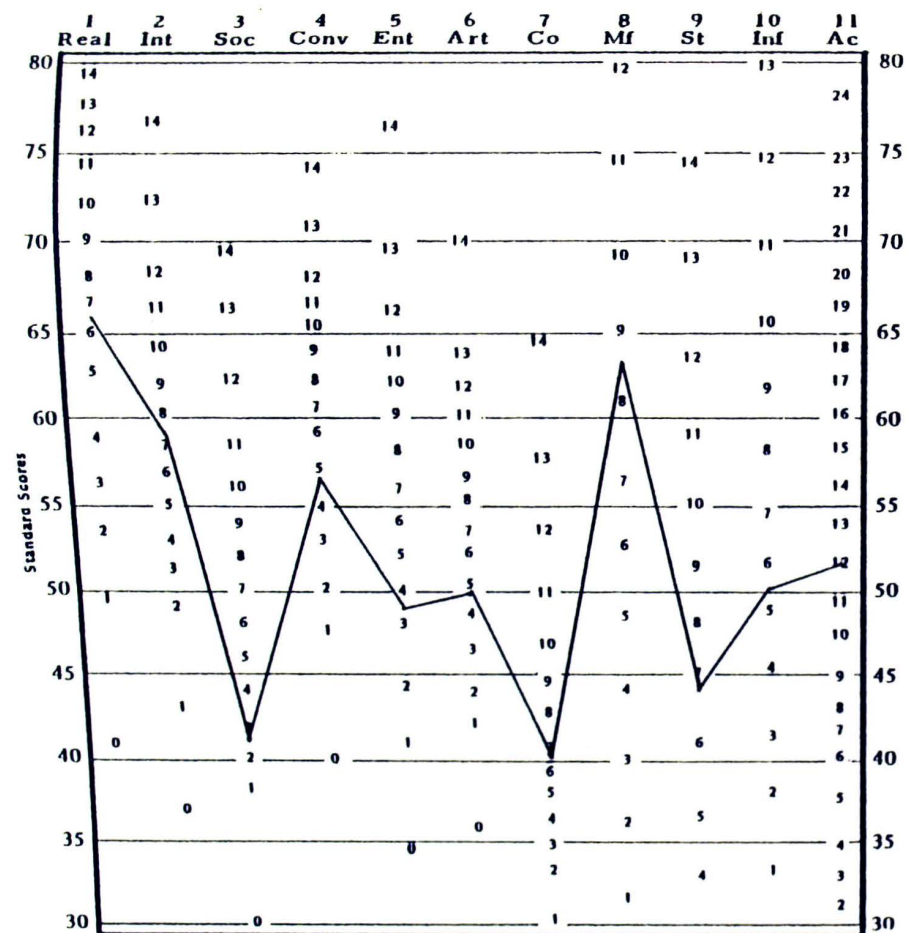


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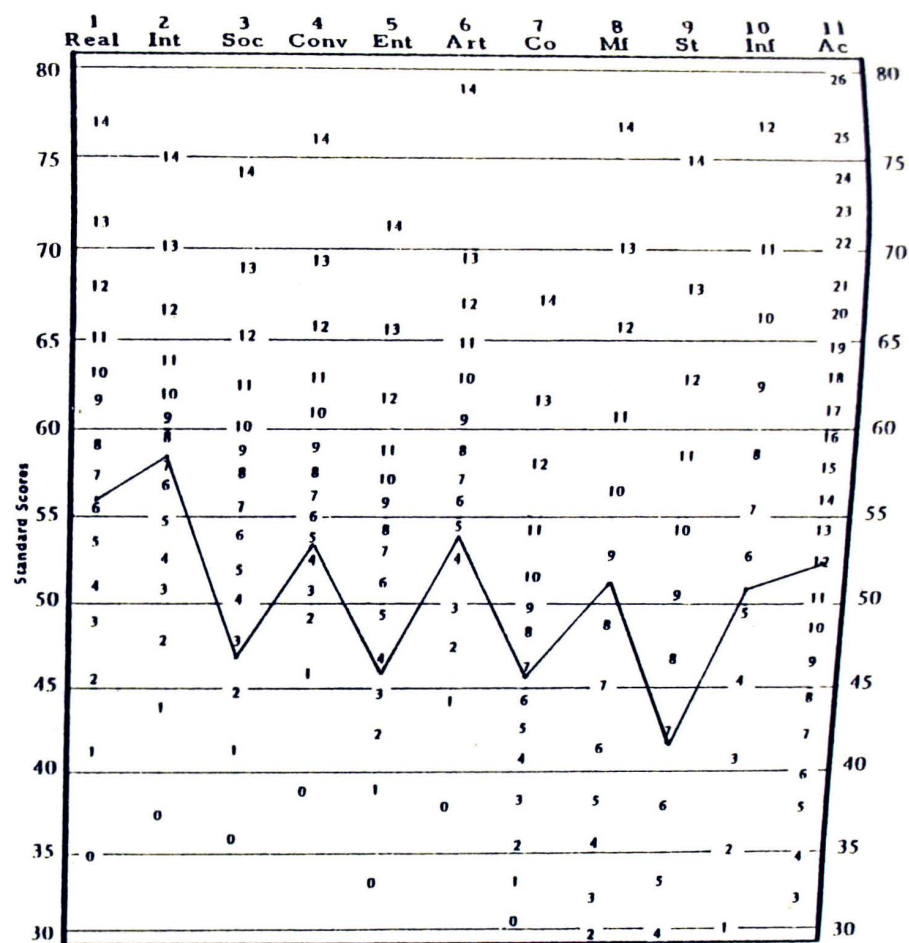


MALES

Figure 5 - Profile of Mean
VPI Scores of Group 5
consisting of Computer
Science majors

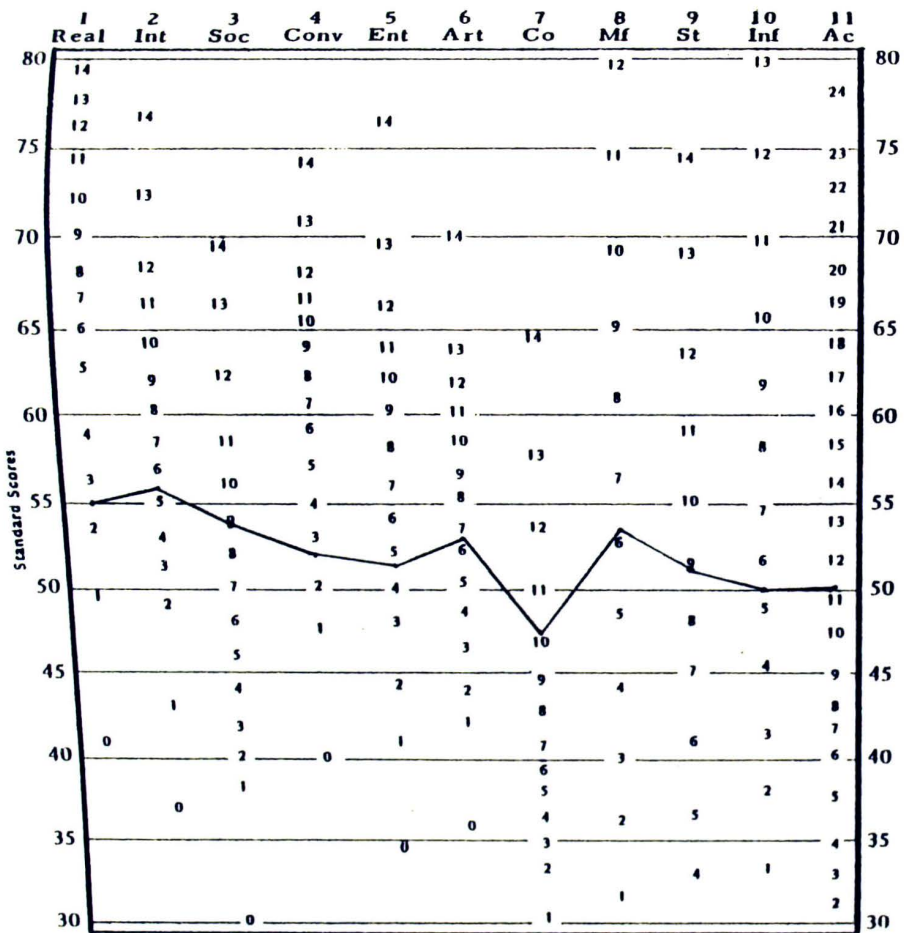


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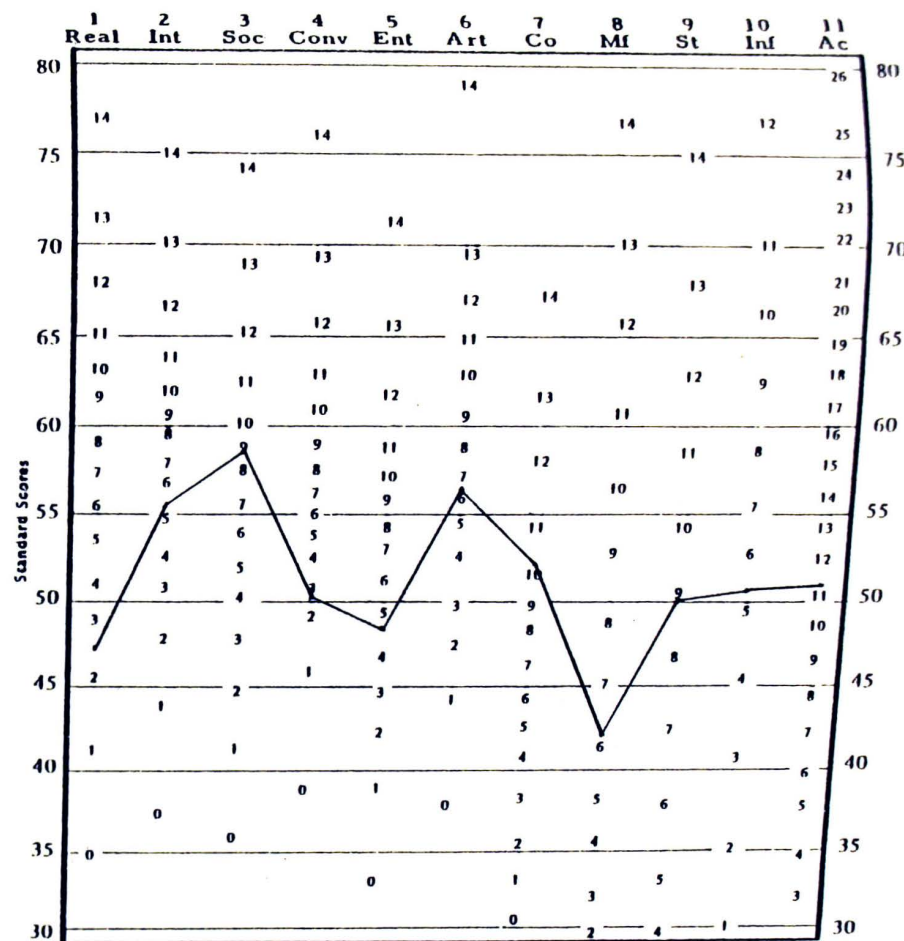


MALES

Figure 6 - Profile of Mean
VPI Scores of Group 6
consisting of Psychology,
Sociology, and Social
Welfare majors

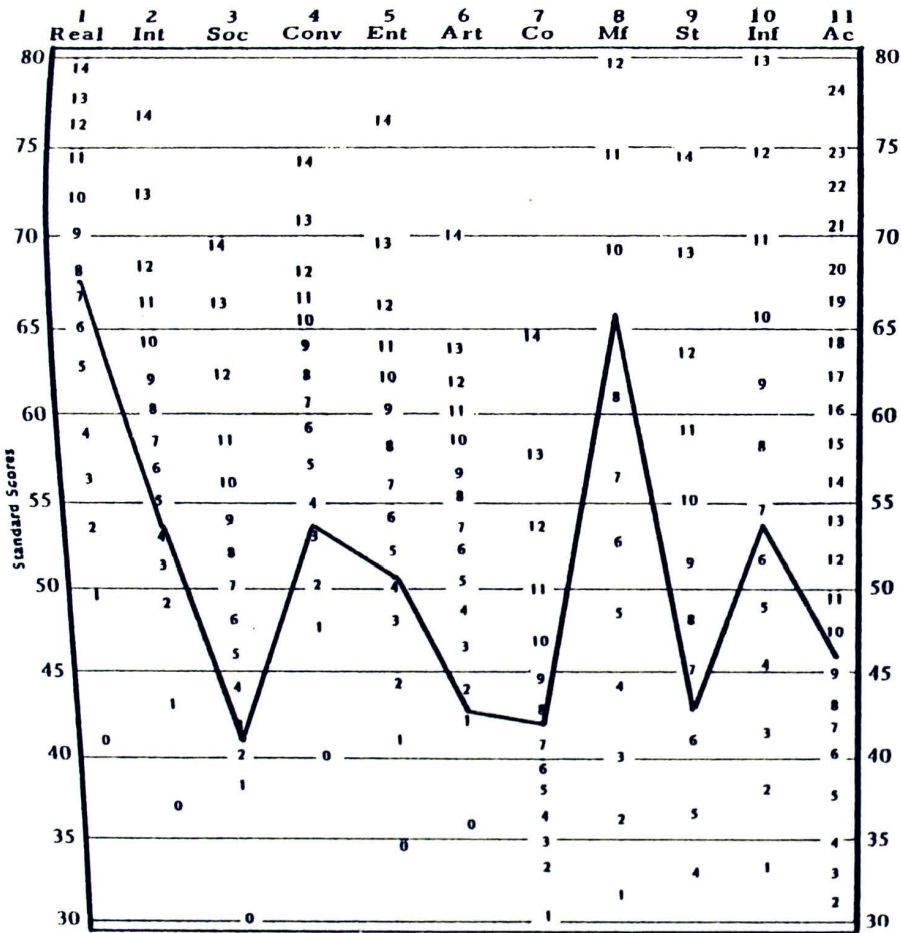


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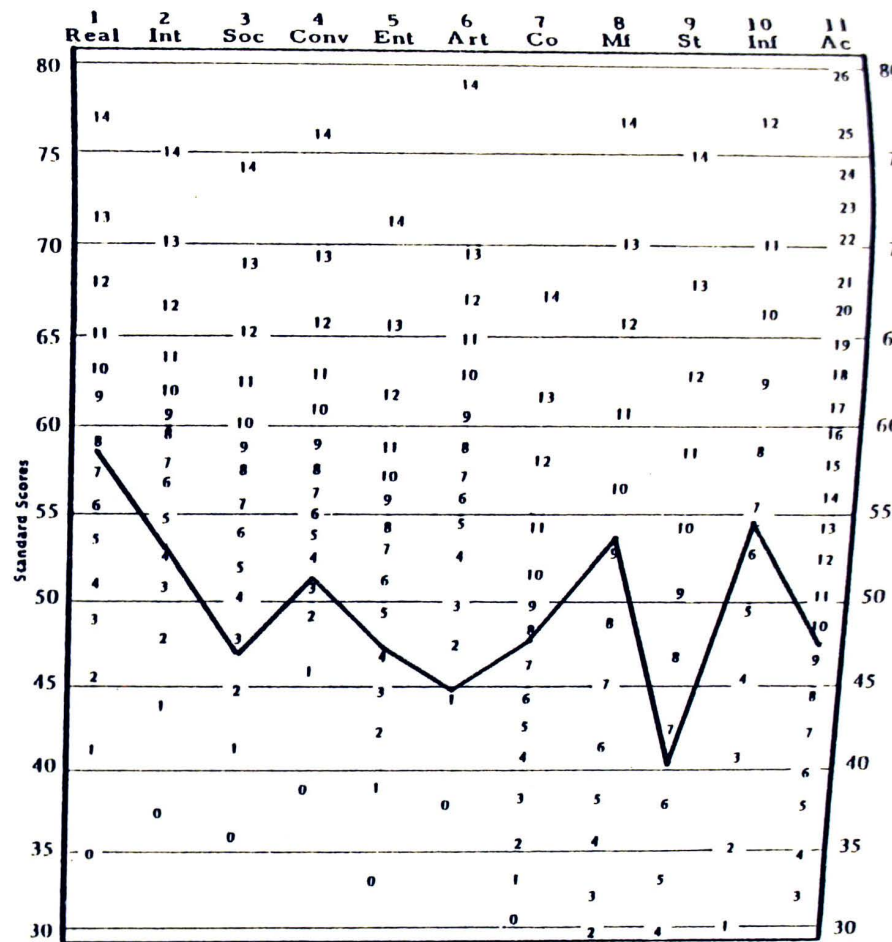


MALES

Figure 7 - Profile of Mean
VPI Scores of Group 7
consisting of General Studies,
Health and Physical Education,
Industrial Technology, and Agriculture
majors

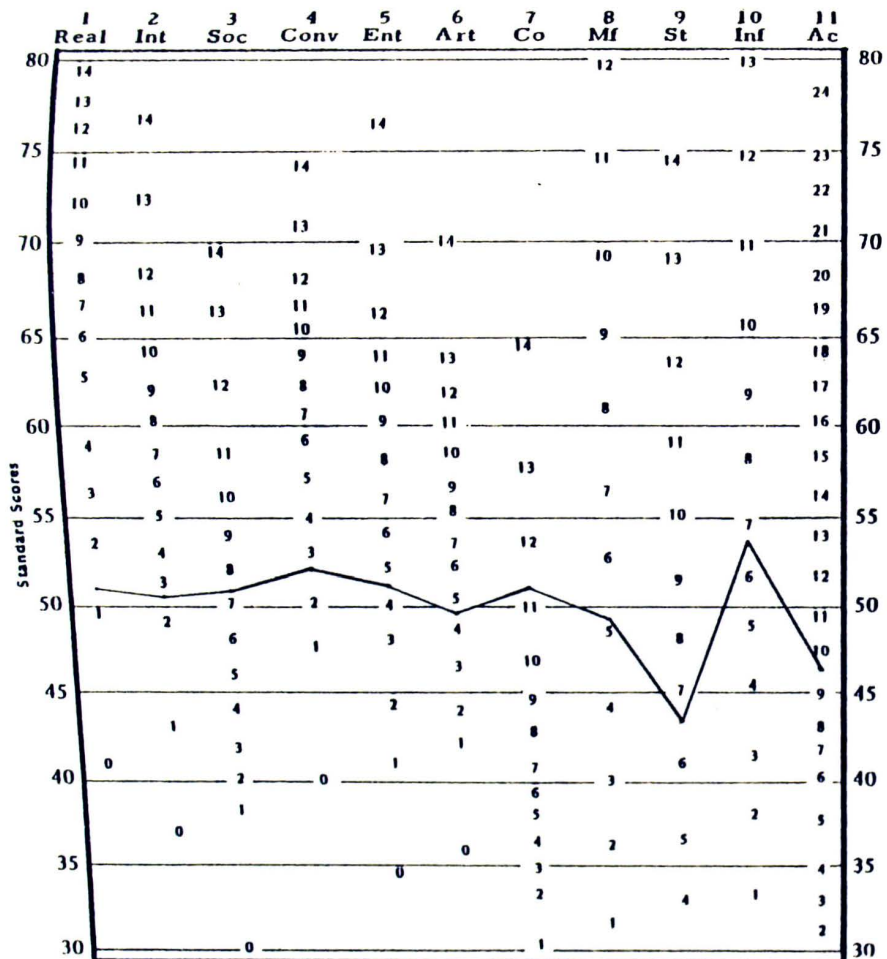


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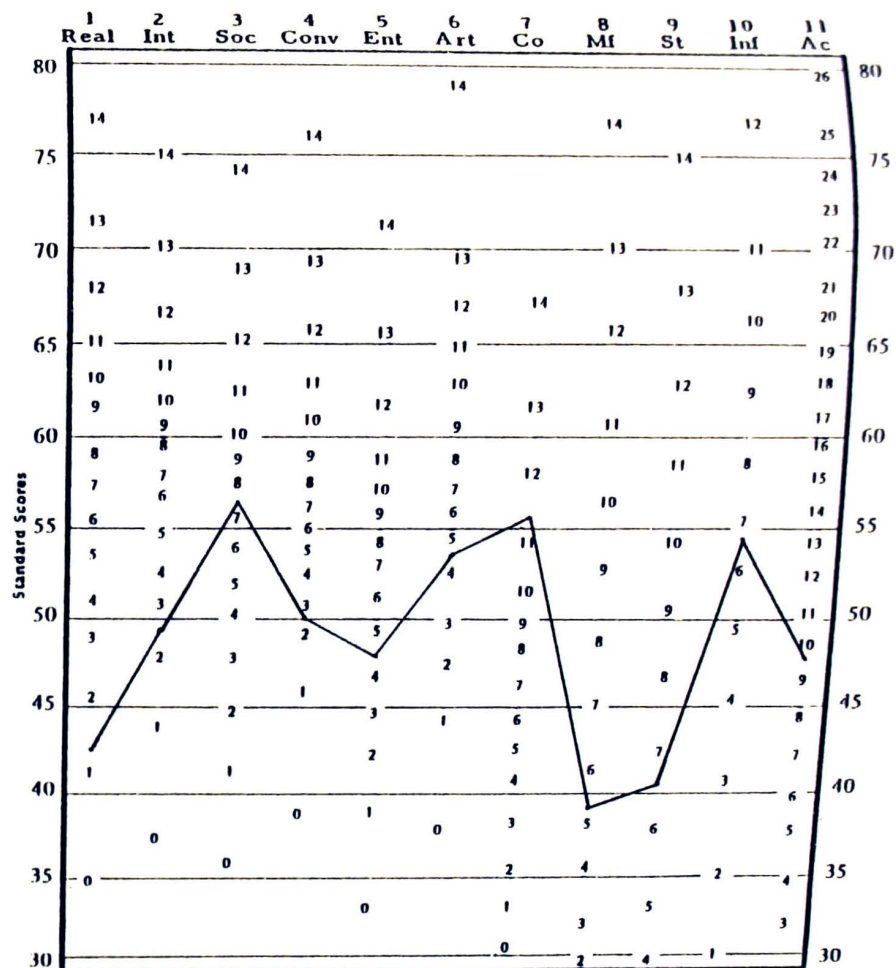


MALES

Figure 8 - Profile of Mean
VPI Scores of Group 8
consisting of
Education majors

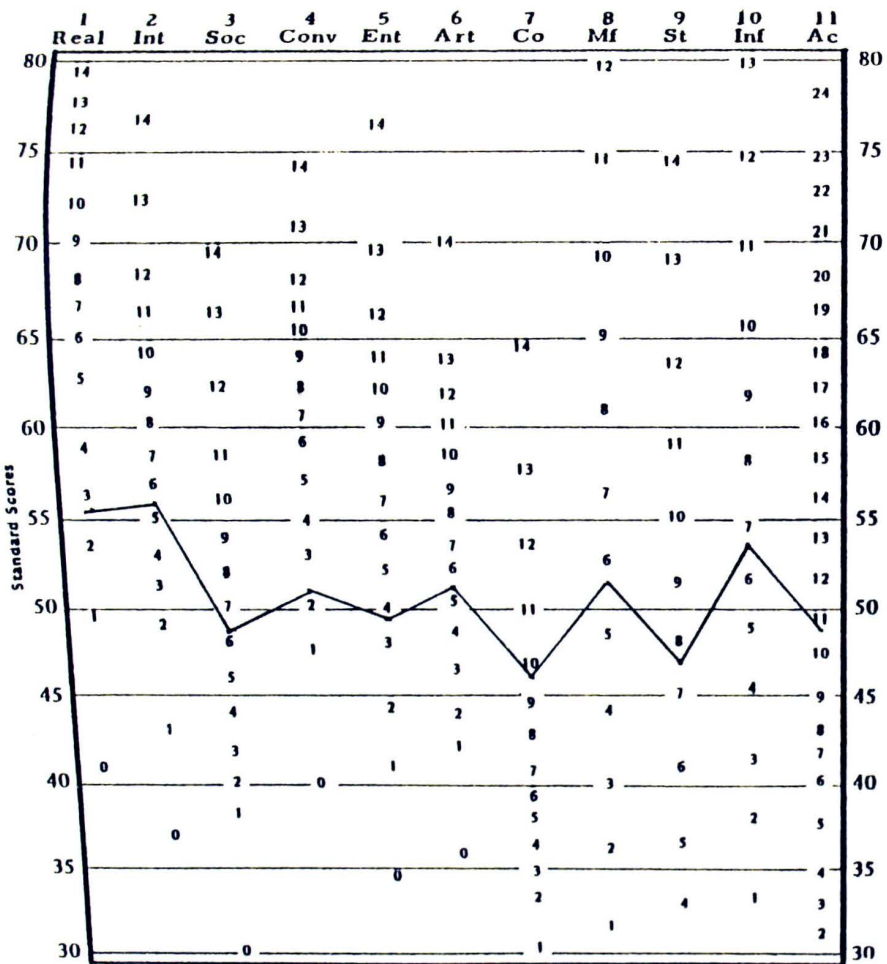


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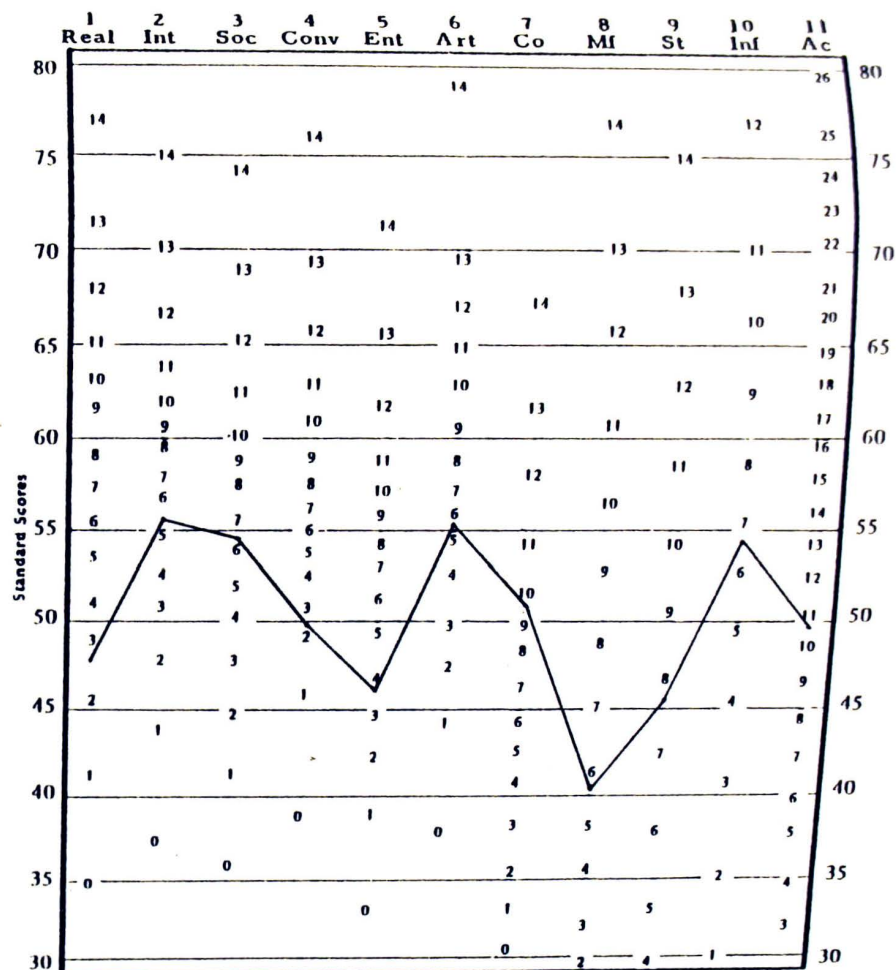


MALES

Figure 9 - Profile of Mean
VPI Scores of Group 9
consisting of
Nursing majors



FEMALES



MALES

APPENDIX C: VOLUNTARY CONSENT

STATEMENT OF WITNESSED ORAL
INFORMED CONSENT INVOLVING STUDENTS

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Written approval for class time administration was obtained from individual professors prior to the administration of the Vocational Preference Inventory (VPI). Upon the specified day and time of VPI administration to their classes, the entire rationale and purpose of the questionnaire was explained and witnessed by the class professor. The following was told to the participants: "This study is being conducted for research required for a master's degree in which a total of 300 students are needed to respond to this short questionnaire of vocational titles developed by John Holland. It is a very non-threatening and rather fun test which takes approximately 20 minutes during which you mark "yes," "no," or leave the answer blank to 160 occupational titles. "Yes" means that the job sounds interesting or fun to you. "No" means it doesn't appeal to you at all, and if you are undecided, leave the answer blank. Your name is not required at all but please list your age, sex, major field of study, undergraduate or graduate student status, and if you have ever been employed in the field you are now studying. The purpose of the study is to find out if there are factors which would differentiate majors, e.g., Nursing majors from psychology majors from Business majors. Information about your age,

major, student status, and employment will help me find strong positive profiles."

Any questions from the potential participants in the study were then answered to their satisfaction and the class was asked to freely and voluntarily complete the questionnaire without inducement, force, fraud, deceit, or coercion. The students could terminate their participation at any time. Questionnaires were distributed and students were individually thanked as they accepted the test and upon their return of it. If the participant and/or professor desired any further information about the results of the study, identification of how to contact the principal investigator was given and/or the name of the participant was recorded for future correspondence.

There were no risks involved to any of the subjects involved in the study. Due to the uncertainty of finding a number of subjects available in any given class to participate, verbal informed consent was chosen as the method for effective consent.